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mine, *i. e.* ammonia in which 2 equivalents of hydrogen are replaced by ethyl, and which, under the influence of a further quantity of bromide of ethyl, lastly is transformed into triethylamine, or ammonia in which the whole of the hydrogen is replaced by ethyl. This is a most powerful alkali, whose properties resemble those of caustic potassa.

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January 24, 1850.

RICHARD OWEN, Esq., Vice-President, in the Chair.

The following communications were read :

1. "Observations on the Freezing of the Albumen of Eggs." By James Paget, Esq., Professor of Anatomy and Surgery to the Royal College of Surgeons. Communicated by Thomas Bell, Esq., Sec. R.S. &c.

The object of this paper is to illustrate a peculiar property of the albumen of the eggs of birds, a property which seems to have its purpose in preserving them from the injurious effects of very low temperatures.

Mr. Hunter observed that a fresh egg will resist freezing longer than one which has been previously frozen and thawed; and he referred this fact to the 'vital power' of the egg in the first case, and the destruction of that power by freezing in the second. The author's experiments confirm those of Mr. Hunter, and prove, also, that when fresh eggs are exposed to very low temperatures, and also in the case of eggs which are decayed, or putrid, or the contents of which have been much altered by mechanical force or by electricity, a shorter time is sufficient for the freezing of such eggs, than is necessary for the freezing of those which are uninjured.

An examination of the rates at which heat was lost by the several eggs, exposed to temperatures varying from zero to 10° Fahr., showed that fresh eggs, though they resist freezing longer than any others, yet lose heat more quickly; and that their resistance to freezing is due to the peculiar property of their albumen, the temperature of which may be reduced to 16° Fahr., or much lower without freezing, although its proper freezing-point is at or just below 32°. Other than fresh eggs lose heat comparatively slowly, but freeze as soon as their temperature is reduced to 32°; fresh eggs lose heat more quickly, but may be reduced to 16° or lower; then, at the instant of beginning to freeze, their temperature rises to 32°.

That this peculiarity of fresh eggs is not due to vital properties, is proved by experiments which show that certain injuries, such as mechanical violence, addition of water, and others, which spoil their powers of resisting freezing, do not prevent eggs from being developed in incubation. By the same and other experiments, which are related, it is made probable that the peculiarity depends on the mechanical properties of the albumen; for, whatever makes the albumen more liquid than it is naturally in the fresh egg, destroys the power of resisting freezing.

The author could find no other substance possessing this property ; and in evidence of its adaptation to the purpose of preserving eggs from the loss of their capacity of developement, which they would suffer in being frozen, he relates experiments in which eggs were kept for a considerable time at temperatures ranging from zero to 10° Fahr., yet were afterwards developed in incubation. By the same series of experiments it was shown, that, although freezing renders the effectual developement of the germ impossible, yet the intensest cold, if freezing does not take place, has no similar result.

2. A Letter from M. Kupffer, to Lieut.-Col. Sabine, For. Sec. R.S., "On the establishment of a Central Physical Observatory at St. Petersburg." Communicated by Lieut.-Col. Sabine.

Observatoire Physique Central, St. Pétersbourg,  
ce 21 Juillet, 2 Août, 1849.

Monsieur et cher ami, — Je suis heureux de pouvoir vous annoncer que l'observatoire physique central, dont le projet a été confirmé par S. M. l'Empereur, il y a deux ans, est achevé, et son activité a commencé dès le 1<sup>er</sup> Juillet.

Cet établissement est destiné, comme j'ai déjà eu le plaisir de vous écrire il y a longtemps, à former un point central pour nos observatoires magnétiques et météorologiques, et en général pour tout ce qui se fait, dans l'étendue de l'Empire de Russie, pour la météorologie et le magnétisme terrestre ; il y a un emplacement suffisamment grand pour contenir plusieurs salles d'observation, pour loger le directeur et son secrétaire et plusieurs calculateurs, pour une bibliothèque et l'archive des observations magnétiques et météorologiques envoyées de differens points de l'Empire. Le directeur de l'observatoire physique central exerce une surveillance active sur toutes les stations magnétiques et météorologiques de l'Empire ; il fait de temps en temps des voyages d'inspection ; les observateurs qu'on emploie dans ces stations reçoivent leurs instructions de l'observatoire de physique ; les instrumens qu'on leur fournit sont vérifiés et comparés aux instrumens de l'observatoire ; des instrumens également vérifiés et comparés sont délivrés à tous les physiciens faisant partie d'expéditions ordonnés par le gouvernement ; toutes les observations magnétiques et météorologiques qu'on fait dans l'étendue de l'Empire sont adressées au directeur de l'observatoire, appréciées, calculées et imprimées par ses soins : on essaie à l'observatoire central toutes les nouvelles méthodes d'observation avant de les mettre en pratique, on s'y occupe de leur perfectionnement ; enfin on y trouve réunis tous les moyens nécessaires pour faire des recherches dans toutes les branches de la physique qui sont dans un rapport plus ou moins direct avec la physique de la terre, et qui exigent une exactitude difficile ou impossible à atteindre dans les cabinets de physique ordinaires.

Maintenant je n'ai qu'un seul vœu à former, c'est que l'exemple de notre gouvernement soit bientôt suivi par le gouvernement anglais, qui a déjà fait de si grands sacrifices pour le magnétisme terrestre. Une longue expérience a du vous apprendre, comme elle me l'a appris, qu'un tel établissement est une nécessité, lorsqu'on